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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>09 November 2007</u>.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 19* is/are pending in the application.

    4a) Of the above claim(s) *1-4* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *5-16 and 19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-4, 5-16, and 19 are pending in this application. Examiner notes that

claims 1-4 are indicated as 'withdrawn' in the amendment. Withdrawing a claim is not

equivalent to canceling a claim accordingly **these claims must be canceled in the**

next office action.

Terminal Disclaimer

2.   The terminal disclaimer filed on 11/09/07 disclaiming the terminal portion of any

patent granted on this application which would extend beyond the expiration date of US

Patent 7,191,350 has been reviewed and is accepted. The terminal disclaimer has

been recorded.

Response to Arguments

3.   **Applicant's arguments filed 11/09/07 have been fully considered but they**

are not persuasive.

In the 1st par. on pg. 12 the Applicant states:

> The Examiner refers to column 5, lines 32 - 44 of Nishiyama as allegedly disclosing
> a power control information analyzer. However, Nishiyama discloses only an
> instruction for changing clock frequency of a specified operation resource in the step
> of inserting the instruction after the detection of the operation sequence. By contrast,
> in the present invention, in the step of detecting an operation resource that is not
> actuated for an instruction section having a predetermined length when said
> predetermined microprocessor is operated, the operation resource is specified by
> the compiler directive, and a detection is executed only for an operation resource
> specified by the compiler directive.

The Examiner respectfully disagrees. Nishiyama discloses selecting a particular operation resource for which to perform power manipulation (see e.g. col. 5, lines 31-33 "selects one hardware resource in a step 802"). As indicated in the rejection below it would have been obvious at the time of invention to include an indication of the resource(s) to select in a compiler directive as claimed.

Claim Objections

4.   **Claims 4, 8, 11 and 14 are objected to because of the following minor informalities:**

Claim 5: line 8 recites "a ... analyzer, which detect an operation". This should be amended to read "a ... analyzer, which <u>detects</u> an operation".

Claims 8, 11 and 14: line 5 of each claim recites "indicating a kind of operation resources". This should be amended to read "indicating a kind of operation <u>resource</u>". Appropriate correction is required.

Claim Rejections - 35 USC § 112

5.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6.   **Claims 8-10 and 14-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claims 8 and 14 recite the limitation "the power control information analyzing step" in line 17 of each claim. There is insufficient antecedent basis for this limitation in the claim. It is assumed this refers to an action preformed by the "power control analyzer" recited in line 7 of each claim.

Claims 9-10 and 15-16 depend from claims 8 and 14 respectively and are rejected for the same reason.

Claim Rejections - 35 USC § 103

7.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8.   **Claims 5, 7, 11, 13 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,790,877 to Nishiyama et al. (Nishiyama) in view of US 6,064,818 to Brown et al. (Brown).**

9.   **Regarding Claims 5 and 11:** Nishiyama discloses a computer-readable instruction converting apparatus having instructions stored thereon for optimizing an instruction program so as to suitably execute the optimized instruction program by a predetermined microprocessor, comprising:

a power control manager, which extracts power control management information

which is written in the instruction program (col. 5, lines 18-25 "the resource utilization

table generation unit 501");

a power control information analyzer, which detects an operation resource based

upon the power control management information extracted by the power control

manager (col. 5, lines 32-44 "In a step 803, a section of cycle not used by the selected

resource is determined by referring [to] the resourced utilization table"), the operation

resource being not actuated for an instruction section having a predetermined length

when the predetermined microprocessor is operated (col. 5, lines 32-44 "If the number

of cycles not used by the resource is larger"); and

a power control instruction applier, which inserts or replaces an instruction

related to a power control operation to the instruction program based upon the detected

result of the power control information analyzer (col. 5, lines 39-43 "In the step 805, an

instruction to lower the clock frequency of the hardware resource is inserted");

wherein a detection by the power control information analyzer includes selection

of an operation resource (col. 5, lines 31-33 "selects one hardware resource in a step

802").

10.   Nishiyama does not disclose the power control manager referring to a complier

directive.

11.   Brown teaches referring to a compiler directive which is written in an instruction

program and is not executed at run-time (col. 3, lines 12-22 "A pragma, sometimes also

called a compiler directive, is a special purpose instruction to the compiler, typically

utilized to turn on or off certain features").

12.   It would have been obvious to one of ordinary skill in the art at the time the

invention was made to have Nishiyama's power control manager reference a compiler

directive as taught by Brown (col. 3, lines 12-22) including an indication of a kind of

operation resource similar to that disclosed by Nishiyama (e.g. col. 4, lines 36-41 "a

resource designation operand "resource" 301"). Those of ordinary skill in the art would

have been motivated to make such a modification in order to provide programmer

control of the resource selection disclosed by Nishiyama (col. 5, lines 31-33 "selects

one hardware resource in a step 802").

13.   **Regarding Claims 7 and 13:** The rejections of claims 5 and 11 are incorporated

respectively; further Nishiyama discloses:

        a first table storing unit, which stores information as to whether or not each of the

operation resources of the predetermined microprocessor is actuated by every

instruction (col. 5, lines 18-25 "the resource utilization table 504"; Fig. 6, Resource

Utilization Table 504);

        wherein the power control information analyzer detects such an operation

resource which is not actuated for the instruction section having the predetermined

length when the predetermined microprocessor is operated based upon the information

stored in the instruction-independent operation resource table storage unit (col. 5, lines

32-44 "In a step 803, a section of cycle not used by the selected resource is determined

by referring [to] the resourced utilization table").

14.   **Regarding Claim 19:** The rejection of claim 11 is incorporated; further Brown

discloses, wherein:

The information contains information for designating a portion in the instruction

program where the power control information analyzing step is performed (col. 3, lines

12-22 "A pragma ... typically utilized to turn on ... certain features"), and

and the information indicates an instruction section analyzed is not the portion

where the power control information analyzing step is performed (col. 3, lines 12-22 "A

pragma ... typically utilized to turn ... off certain features").

15.   **Claims 6, 8-9, 12 and 14-15 are rejected under 35 U.S.C. 103(a) as being**

unpatentable over US 5,790,877 to Nishiyama et al. (Nishiyama) in view of US

6,064,818 to Brown et al. (Brown) further in view of US 5,452,401 to Lin (Lin).

16.   **Regarding Claims 6 and 12:** The rejections of claims 5 and 11 are incorporated

respectively; further Nishiyama discloses:

the power control management information contains information for designating

said predetermined length of the instruction section (col. 5, lines 34-37 "whether the

number of cycles not used by the resource is larger than the number of cycles required

to change the clock").

17.   The Nishiyama-Brown combination does not explicitly disclose the power control

information analyzer changes the predetermined length of the instruction section based

upon power control management information

18.   Lin discloses changing the predetermined length of the instruction section based

upon the power control management information (col. 4, lines 41-50 "Any suitable

preselected amount of time can be used ... for turning on and for turning off the

functional units").

19.   It would have been obvious to a person of ordinary skill in the art at the time of

the invention to combine the teachings of Nishiyama-Brown and Lin because one of

ordinary skill in the art would have been motivated to further conserve power (Lin col. 3,

lines 54-59 "the present invention results in a very significant reduction in power

consumption").

20.   **Regarding Claims 8 and 14:** Nishiyama discloses a computer-readable

instruction converting apparatus having instructions stored thereon for optimizing an

instruction program so as to suitably execute the optimized instruction program by a

predetermined microprocessor, comprising:

a power control manager, which extracts power control management information

which is written in the instruction program (col. 5, lines 18-25 "the resource utilization

table generation unit 501");

a power control analyzer, which detects an operation resource which is not

actuated for an instruction section having a predetermined length when the

predetermined microprocessor is operated (col. 5, lines 32-44 "In a step 803, a section

of cycle not used by the selected resource is determined by referring [to] the resourced

utilization table"); and

a power control instruction applier, which inserts or replaces an instruction

related to a power control operation in the instruction program based upon the detection

result of the power control information analyzer (col. 5, lines 39-43 "In the step 805, an

instruction to lower the clock frequency of the hardware resource is inserted");

wherein a detection by the power control information analyzer includes selection

of an operation resource (col. 5, lines 31-33 "selects one hardware resource in a step

802").

21.   Nishiyama does not disclose the power control manager referring to a complier

directive indicating a kind of operation resource.

22.   Brown teaches referring to a compiler directive which is written in an instruction program and is not executed at run-time (col. 3, lines 12-22 "A pragma, sometimes also called a compiler directive, is a special purpose instruction to the compiler, typically utilized to turn on or off certain features").

23.   It would have been obvious to one of ordinary skill in the art at the time the invention was made to have Nishiyama's power control manager reference a compiler directive as taught by Brown (col. 3, lines 12-22) including an indication of a kind of operation resource similar to that disclosed by Nishiyama (e.g. col. 4, lines 36-41 "a resource designation operand "resource" 301"). Those of ordinary skill in the art would have been motivated to make such a modification in order to provide programmer control of the resource selection disclosed by Nishiyama (col. 5, lines 31-33 "selects one hardware resource in a step 802").

24.   Further, the Nishiyama-Brown combination does not disclose reassembling the instruction program in such a manner that the instruction section is made long.

25.   Lin teaches an instruction reassembling unit, which reassembles the instruction program in such a manner that the instruction section detected during power control analysis is made long, during which an actuation of an operation resource can be stopped (col. 11, lines 25-28 "an optimizing compiler 802 to order the machine code instructions in a way which maximizes the power saving").

26.   It would have been obvious to a person of ordinary skill in the art at the time of

the invention to reassemble Nishiyama's instruction program (col. 4, lines "intermediate

language [program] 503") in such a manner that the instruction section detected during

power control analysis is made long. Those of ordinary skill in the art would have been

motivated to make such a modification in order to "maximize the power saving" (Lin, col.

11, lines 25-28).

27.   **Regarding Claims 9 and 15:** The rejections of claims 8 and 14 are incorporated

respectively; further Lin teaches:

the instruction reassembling unit corresponds to instruction rearranging unit

which rearranges instructions while maintaining an instruction dependent relationship

established in the instruction program (col. 11, lines 15-24 "This decoded information

may take the form of data dependency information").

28.   **Claims 10 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable**

over US 5,790,877 to Nishiyama et al. (Nishiyama) in view of US 6,064,818 to

Brown et al. (Brown) further in view of US 5,453,401 to Lin (Lin) and further in

view of 2006/0168463 to Terechko et al. (Terechko).

29.   **Regarding Claims 10 and 16:** The rejections of claims 8 and 14 are

incorporated respectively; further the Nishiyama-Brown-Lin combination does not teach

replacing one instruction contained in the instruction program with another instruction.

30.   Terechko teaches replacing one instruction contained in the instruction program

by another instruction having the same process result as that of the one instruction (par.

[0068] "it may be desirable to remap registers to concentrate the registers within a

reduced number of register banks").

31.   It would have been obvious to one of ordinary skill in the art at the time the

invention was made to replace one of the instructions contained in Nishiyama's

instruction program () by another instruction having the same process result as that of

the first instruction as taught by Terechko (par. [0069]). Those of ordinary skill in the art

would have been motivated to make such a modification in order to further decrease

power consumption (Terechko par. [0069] "it may be desirable to remap registers to

concentrate the registers within a reduced number of register banks").

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jason Mitchell whose telephone number is (571) 272-

3728. The examiner can normally be reached on Monday-Thursday and alternate

Fridays 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jason Mitchell/
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1/3/08

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